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I hereby certify that the items of correspondence identified below were today February 4 2002 faxed to:

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Attention: Examiner Noel Kamen Fax 703 308 7766 Total ~~32~~ pages

1 Certificate of Faxing (1 page)

Application 08 / 477 703:

2 Supplemental Amendment to Petition filed December 27 2001 (2 pages)

3 Copy of Petition filed December 27 2001 (3 pages)

4 Copy of Notification of Non-Compliance mailed late November 2001 (1 page)

5 Copy of Appeal Brief filed September or October 2001 (9 pages)

6 Copy of Amendment filed April 25 2001 (18 pages)

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GROUP 3700

If any pages are not properly received, please immediately phone the undersigned at 310 208 6606.

Mitja Hinderks.

February 4 2002



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Honorable Commissioner of Patents and Trademarks
Washington DC 20231

Serial No **08 / 447 703**
Title **A FLUID WORKING DEVICE**
Filed **June 7 1995**
Group Art Unit **3747**
Examiner **N Kamen**

February 4 2002

SUPPLEMENTAL AMENDMENT

to

PETITION under 37 CFR 1.181 filed December 27 2001

Dear Sir:

The above petition requests that the Amendment filed on April 25 2001 (copy attached) after Final rejection mailed October 25 2000 be entered. Richard Harris, the previous attorney of record, prepared the petition (copy attached) at extremely short notice, under circumstances set out below. In that petition, arguments refuting the objections of the examiner to entry were not presented. Such arguments were fully presented in the Appeal Brief filed late September or October, which is hereby attached and forms part of this petition. The most important of many important arguments have been highlighted. (Please excuse the vagueness as to dates: Mr Harris never dated any document to the PTO. He said it was covered in the letter of mailing, but the letters of mailing were never forwarded to me.)

As alluded to in the Appeal Brief, Richard Harris and I worked together for around thirty years, on at least a dozen complex separate patent applications. We have always strived, nearly always successfully, to fully meet the examiner's objections, both by coherent and fair argument and by proper modification of claims, etc. In all that time, all our responses have always been entered, other than on the occasion which is subject of this petition.

In November, Richard Harris received a Notification of Non-Compliance with the Requirements of 37 CFR 1.192(c) (copy attached). The examiner felt the Appeal Brief's argument's were not proper subject for an appeal, and gave 30 days notice to ut them in the form of a petition. Because Mr Harris had been out of town visiting relatives when the Notice was received, he had only four days to prepare the petition by the due date.

Additionally in this petition, the applicant requests that this that the Notice of Non-Compliance be withdrawn. Under the circumstances outlined in the Brief it seems, as a matter of common sense and also according to a "Reasonable Person" standard, that the Appeal Brief arguments are appropriate to this particular case at this time.

continued.

08 / 477 703 Supplemental Amendment to Petition 2 4 2002

page two

Richard Harris did not withdraw the appeal. The applicant has not withdrawn and does not withdraw the appeal. He considers the Appeal to be still before the commissioner.

Respectfully submitted,

A handwritten signature in black ink, consisting of stylized, connected letters that appear to read 'MH' followed by a long horizontal stroke.

Mitja Victor Hinderks.

Sole Inventor, applicant and power-of-attorney of record.

Attachments:

- Petition filed December 27 2001*
- Notification of Non Compliance Received late November 2001*
- Appeal Brief filed September ? October 2001*
- Amendment filed April 25 2001*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of

Mitja V. HINDERKS

Group Art Unit: 3747

Serial No.: 08/477,703

Examiner: N. Kamen

Filed: June 7, 1995

For: A FLUID WORKING DEVICE

December 27, 2001

PETITION TO COMMISSIONER UNDER 37 CFR 1.181

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

Applicant hereby petitions the Commissioner to enter the Amendment filed April 25, 2001 after Final Rejection mailed October 25, 2000. The Examiner refused entry of the amendment because it raised new issues and would require further consideration and/or search. Applicant takes issue with this holding of the Examiner. New claims 195, 196 and 197 were added following the cancellation of claims 69, 120 and 185. The new claims all relate to subject matter already before the Examiner. See claims 144, 187-189 and 191. Claims 61, 66, 67, 75, 106, 118, 121 and 184 were amended to render the claims more specific and even more to avoid the art. Accordingly, no new issues were raised, nor further search required.

The Advisory Action was apparently sent out by the Examiner, but never received by applicant. Toward the end of the response period, having not heard from the Examiner, applicant's attorney left an inquiry message on the Examiner's voice mail which was promptly responded to by indicating that the application had been allowed. Applicant then waited for a Notice of Allowance to be issued, which also was never received. The Examiner was again contacted, who informed

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GROUP 3700

applicant that an error had been made and that the amendment under consideration had been refused entry. A one-page Advisory Action with no date was received shortly thereafter. Since the extension period was about to expire, applicant filed a Second Submission under 37 CFR 1.129 on October 24, 2001 and Briefs on October 25, 2001. On November 27, 2001, a fax was received by applicant's attorney upon which no mailing date was indicated stating to the effect that the Briefs did not contain arguments subject to review by the Board of Appeals and giving applicant a month or 30 days within which to respond – in this situation a 30-day period. Applicant is thus responding within the 30 days. It is therefore submitted that no new issues are raised that would require further consideration and/or search. It is therefore respectfully requested that the Amendment After Final Rejection be entered and the case be passed to issue.

The applicant's comments are as follows:

The applicant has never not had a response entered. The response was applicant's best effort to resolve all outstanding issues. No reason was given for non-entry of the amendment. Applicant has sought an interview with the Examiner, but has not been successful to get one granted. Applicant would like to know what part of the amendment was objectionable and to suggest modifications and amendments. In the event the Petition is denied, the applicant would like to have detailed reasons why the response to the Final Rejection was not entered upon review of the reason. The applicant desired an opportunity to make possibly minor supplemental amendments that would permit a Notice of Allowance to be issued after the many years the applicant has maintained this application.

A \$130.00 petition fee is enclosed herewith. The Commissioner is hereby authorized to charge any deficiency in the fee(s) filed, or asserted to be filed, or which should have been filed herewith to Deposit Account No. 08-0873.

Respectfully submitted,

Richard C. Harris
Registration No. 17,194

P.O. Box 42266
Washington, DC 20015
Telephone & Facsimile: (301) 299-9498


UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: ASSISTANT COMMISSIONER FOR PATENTS

Washington, D.C. 20231

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
---------------------------------	-------------	---	---------------------

EXAMINER

ART UNIT	PAPER
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41

DATE MAILED.

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

NOTIFICATION OF NON-COMPLIANCE WITH THE REQUIREMENTS OF 37 CFR 1.192(c)

The brief does not contain a concise explanation of the invention defined in the claims involved in the appeal, which refers to the specification by page and line number, and to the drawing, if any, by reference characters as required by 37 CFR 1.192(c)(5). The Summary of the Invention merely gives a broad outline of the invention.

The brief does not contain arguments of the appellant with respect to each of the issues presented for review in 37 CFR 1.192(c)(6), and the basis therefor, with citations of the authorities, statutes, and parts of the record relied on as required by 37 CFR 1.192(c)(8). The brief does not contain, for each rejection under 35 U.S.C. 103, an argument which specifies the errors in the rejection and, if appropriate, the specific limitations in the rejected claims which are not described in the prior art relied upon in the rejection, and an explanation how such limitations render the claimed subject matter unobvious over the prior art. If the rejection is based upon a combination of references, the argument must explain why the references, taken as a whole do not suggest the claimed subject matter, and shall include, as may be appropriate, an explanation of why features disclosed in one reference may not be properly combined with features disclosed in another reference. A general argument that all the limitations are not described in a single reference does not satisfy the requirements of 37 CFR 1.192(c)(8)(iv).

Appellant's arguments deal with 1) The handling of the Advisory action dated 4/25/01. Specifically, arguing that the Advisory action should have entered the amendment after final dated 4/25/01. The amendment after final placed the claims in condition for allowance. 2) The appellant never received the Advisory action because of incomplete/incorrect mailing. 3) An interview should have been granted after the final rejection. 4) The examiner's error of incorrectly identifying the application as being allowed.

The above arguments are not proper for an appeal brief. Rather, they should be directed to the Office of Petitions for consideration See MPEP 1002.

The appellant is given 1 month or 30 days to respond, whichever is longer.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before the Board of Patent Appeals and Interferences

In re the application of

Mitja V. HINDERKS

Serial No.: 08/477,703

Filed: June 7, 1995

For: A FLUID WORKING DEVICE

APPEAL BRIEF

On Appeal From Group Art Unit 2787

Richard C. Harris
P.O. Box 42266
Washington, DC 20015
Telephone & Facsimile: (301) 299-9498

I. REAL PARTY IN INTEREST

The real party in interest in this application and appeal is the inventor,
Mitja V. Hinderks.

II. RELATED APPEALS AND INTERFERENCES

None.

III. STATUS OF CLAIMS

Claims originally filed: 1-20

Claims added: 21-194

Claims allowed: 54, 56, 60, 107, 111, 116, 117, 119, 120, 122, 124, 125,
127, 129, 130, 132, 134, 135, 137, 139, 140, 142, 144, 145, 147, 149, 150, 152,
154, 155, 157, 159, 160, 162, 164, 165, 167, 169-177, 179 and 181-183.

Claims cancelled: 1-53, 56-59, 72-74, 77, 79, 88, 93-97, 105, 109 and 110.

Claims objected to: 64, 65, 71, 81, 84, 85, 87, 100-102, 178 and 180.

Claims rejected: 61-63, 66-70, 75, 76, 78, 80, 82, 83, 86, 89-92, 98, 99,
103, 106, 108, 112-115, 118, 121, 123, 126, 128, 131, 133, 136, 138, 141, 143,
146, 148, 151, 153, 158, 161, 163, 166, 168 and 184-194.

Claims on appeal: 61-63, 66, 68-70, 75, 76, 78, 80, 82, 83, 86, 89-92, 98,
99, 103, 106, 108, 112, 115, 118, 121, 123, 126, 128, 131, 133, 136, 138, 141,
143, 148, 151, , 153, 156, 158, 161, 163 and 166.

IV. STATUS OF AMENDMENTS

All amendments during prosecution were entered, with the exception of the
Amendment filed after Final Rejection which was refused entry.

V. SUMMARY OF THE INVENTION

The present invention relates to a device for the working of fluids in which a component reciprocates in a cylinder assembly which is composed of ceramic pieces held together by tubular fasteners, which ceramic pieces have an electric current therein and manufactured depressions in the component and cylinder assembly to enable fluid worked by the device to fill the depressions. The device has a housing of insulating material to restrict heat transfer from the device and means surrounding the cylinder assembly for passage of fluids therethrough which contains filamentary material.

VI. ISSUES

The issues in this appeal are the propriety or impropriety of the Examiner's rejection of claims 61-63, 66, 68-70, 75, 76, 78, 80, 82, 83, 86, 89-92, 98, 99, 103, 106, 108, 112, 115, 118, 121, 123, 126, 128, 131, 133, 136, 138, 141, 143, 148, 151, , 153, 156, 158, 161, 163 and 166.

VII. GROUPING OF CLAIMS

Claims 61, 66-70, 75, 76, 78, 80, 83, 86, 89-92, 108 have been grouped together and stand or fall together.

Claims 62, 63, 106, 131, 141, 146, 151, 156 and 161 have been grouped together and stand or fall together.

Claims 82, 103, 118, 128, 133, 136, 138, 143, 148, 153, 158, 163, 166 and 168 have been grouped together and stand or fall together.

VIII. ARGUMENT

The Amendment of April 25, 2001 should have been entered and the case passed to issue, or in the alternative, the appellant should have been given sufficient time to interview the Examiner to resolve issues. Neither was made available to the appellant.

The appellant objects to and appeals the prosecution of this case by the Patent Office in the period subsequent to April 25, 2001, as follows:

Richard Harris and the appellant have been working together for a long period to further a series of parallelly filed applications, of which this case is one, based on a parent case. During many years dealing with the present examiner and his predecessor, the appellant and his attorney have always strived to give proper consideration to Patent Office law, the examiner's arguments, to the citations involved and to always write claims which as clearly as they could distinguished over the prior art.

In the present case, the Examiner prepared a Final Rejection in October of 2000, in which three main claims and their dependent claims were allowed, four main claims and most of their dependent claims were rejected, with a few claims objected to.

The client and his attorney spent a great deal of time working on a response to this Final Rejection, giving every aspect the fullest consideration. The four rejected main claims were modified to meet the Examiner's objections and a

comprehensive response, complete with all arguments, was timely filed April 25, 2001.

The record of the client-attorney team is good. In the equally complex parallel cases, all claims were allowed, in one case before the present examiner, and in another case before a different examiner. The appellant understands that a third parallel case may soon have most claims allowed.

OBJECTIONS

The appellant objects to the Patent Office handling of the case as follows:

No response to the Amendment of April 25, 2001 was received. The attorney became concerned and made a telephone message inquiry to the Examiner's office. He later received a message that the case had been allowed in mid-September 2001. After no Notice of Allowance was received, several messages were left for the Examiner. (It is understood that he was away from the Office at that time for some period.)

On October 16., 2001, the appellant managed to speak to the Examiner about another case he was prosecuting directly. In passing, he mentioned that no Notice of Allowance had been received in the present case. While on the phone, the Examiner looked up the record on the computer. It eventually transpired that when he received the attorney inquiry, he had inadvertently punched in the wrong serial number (he used the 09/series), and so mistakenly informed the attorney of the allowance of case that had nothing to do with the present application. The inspection of the record of this case during the phone conversation suggested that

two Advisory Actions had been sent out, neither of which had been received. the Examiner faxed copies of these documents that day, copies of which are attached.

Attention is drawn to the fact that the first communication in May 2001 consists only of a cover sheet, without any work sheet(s) containing advisory material. The cover sheet has the attorney's correct address. The lack of receipt could have been caused for a number of reasons. The lack of delivery prompted the Office to send a second Advisory Action. However, that was incorrectly sent to the attorney's old address, last used perhaps five years ago, which also was not delivered. In addition to the Patent Office's incomplete/incorrect mailings of record, appellant additionally objects to the fact that aspects of the response were considered irrelevant, and that the advisory action essentially said the situation was unchanged since the Examiner's Final Rejection.

Reviewing the changes made to claim 61, where "assembled" was changed to "assembled and abutted," it is difficult to see how this could entail a new search. The disclosure has always been of assembled and abutted elements and the claims have related to elements assembled and held together in tension for years in this case. (It is difficult to see how they could not abut) and also for years in other parallel cases.

In claim 106, all the elements claimed remain unchanged, the only difference being a small change of phrasing (the "housing" became a "structure"). Would this warrant a new search?

In claim 118, the claimed device is now within a "structure." This enclosing element, be it housing or structure, has been claimed in the present case for years and has been claimed for years in at least one of the other parallel cases.

One of the advisories indicated that the response might require further searches. Appellant did not think these would be necessary when drafting the claims. It seems very unlikely that further searches would be required in ALL FOUR of the amended claims. It would have been more appropriate for the advisory action to have indicated which claims required further searches, giving appellant an opportunity to withdraw those claims.

A further objection is that, under the circumstances, the applicant did not have an opportunity to meet with the Examiner to review outstanding issues. This is a very high page volume case and appellant sympathizes with the Examiner who has to dig into it, then get involved with many other cases, before getting back to appellant's six months later. Appellant wants to get all cases to closure; so for the last half-year or so, has indicated in writing and during phone conversations with the Examiner, the appellant's readiness to travel to Washington for a meeting, either to explain aspects of the invention not entirely clear, or to negotiate claims that would be acceptable to all parties. It is our opinion that before issuing the Advisory Action, a meeting should have been arranged.

In most circumstances, an appeal would have been based on the claims that the Examiner finally rejected. In the present case, that is pointless, because appellant amended claims after Final Rejection to overcome the examiner's

objections. An appellate body would reject a defense of the earlier rejected claims by citing our own modification. The present case is one of three parallel cases. One of the other two had all claims allowed and was subsequently abandoned. The other has by now had a substantial proportion of claims allowed.

All the features cited in each of the present case's four rejected main claims have been part of the claims of this case for years and have also been part of at least one of the parallel cases' claims for years. As such, they must already have been searched for in the preceding art.

IX. APPENDIX

The claims on appeal can be found in the appendix attached hereto.

X. CONCLUSION

In view of the foregoing, it is respectfully submitted that claims 61-63, 66, 68-70, 75, 76, 78, 80, 82, 83, 86, 89-92, 98, 99, 103, 106, 108, 112, 115, 118, 121, 123, 126, 128, 131, 133, 136, 138, 141, 143, 148, 151, 153, 156, 158, 161, 163 and 166 should be entered and allowed or entered and remanded to the Examiner for resolution.

Accordingly, it is respectfully requested that the Honorable Board of Appeals reverse the Examiner's position regarding the non-allowability of claims 61-63, 66, 68-70, 75, 76, 78, 80, 82, 83, 86, 89-92, 98, 99, 103, 106, 108, 112, 115, 118, 121, 123, 126, 128, 131, 133, 136, 138, 141, 143, 148, 151, 153, 156, 158, 161, 163 and 166 and the case be passed to an early issue, or in the alternative, remand the case to the Examiner for further consideration of the claims which

were refused entry due to the appellant's lack of time for consideration of the advisory for which he was not at fault.

Respectfully submitted,

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Registration No. 17,194

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Telephone & Facsimile: (301) 299-9498

Attorney Docket No. RCH 22614-G-DIV

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of

Mitja V. HINDERKS

Serial No.: 08/477,703

Group Art Unit: 3747

Filed: June 7, 1995

Examiner: N. Kamen

For: A FLUID WORKING DEVICE

AMENDMENT UNDER RULE 116

Honorable Commissioner of
Patents and Trademarks
Washington, DC 20231

Sir:

In response to the Final Rejection mailed October 25, 2000, the period for response having been extended three months by the attached petition and fee, applicant submits the following amendments and arguments.

IN THE SPECIFICATION

Page 199, replace the paragraph beginning at line 1 with the following rewritten paragraph:

--should be so sized as to accommodate the gas flows of the largest engines likely to use that module. Figures 408 to 411 illustrate schematically various possible gas flow layouts, wherein 3126 indicates a multiplicity of equal sized torroidal combustion chambers, 3004 the moving component, 3007 the "fixed" housing (which, in all these embodiments, could also rotate), 3057 an enclosure or casing. A represents charge air volume, B high temperature and pressure exhaust, C lower

temperature/pressure exhaust. Filamentary material is shown at 3128A. Porting is not shown, but can be as described elsewhere in this disclosure. Solid arrows describe gas flows through ports, dotted arrows show gas flow to and/or from transfer ports or flows via passage or plenums as described elsewhere herein. Insulation is indicated (schematically, like all other components) at 3127. In Figure 408, insulation separates charge flow from hot components, charge flows into the combustion chamber, exhaust flow from it into a central exhaust gas reservoir. Obviously the flows could be reversed, volumes A and B transposed, insulation moved to the interface of component 3004 and the central (now charge) gas reservoir or plenum. Figure 409 shows a system having transfer ports, indicated schematically at 3128. Here again, the flows could be reversed, volumes transposed, insulation repositioned. Figure 410 shows a layout where exhaust gas flows adjacent to the structural component of 3004 and 3007 are used to reduce heat flows (i.e., thermal gradients) across these components, with the center of the engine occupied by a mechanical system 3130. If 3130 were a fuel delivery system, this could serve to maintain liquid fuel under pressure at temperatures greater than boiling. A compressor/turbine system is indicated at 3129/3134.—

IN THE CLAIMS

Please cancel claims 69, 120, 185 without prejudice or disclaimer, amend claims 61, 66, 67, 75, 106, 118, 121 and 184 and add new claims 195-197 as follows.

MITJA:

10/17/01

YOU WERE FAXED ALL THAT
I RECEIVED. PROBABLY THE
ADVISORY ACTION WAS DUPLICATED AND
APPLIED TO BOTH 5/4/01 AND 6/13/01
WE MUST WORK WITH ADVISORY ACTION
RECEIVED. KAMRAN GAVE US BOTH
TO COVER HIS DUTY EVEN THOUGH
WE NEVER RECEIVED ANY NOTICE.

RCH

Please substitute the following amended claims 61, 66, 67, 75, 106, 118, 121 and 184 for the corresponding claims previously presented.

61. *(Twice Amended)* A device for the working of fluids comprising at least one cylinder assembly and a component reciprocable therein, said component having two longitudinal extremities and at least one circumferential projection, said cylinder assembly having at least one internal circumferential depression in which said projection is positioned to reciprocate, said projection and depression forming a pair of torroidal fluid working chambers of cyclically variable capacity, said component having at least one internal passage for movement of fluids to or from said working chambers, said assembly including a multiplicity of elements of ceramic material held in assembled and abutted condition by at least one fastener loaded in tension.

66. *(Twice Amended)* The device of claim 61, including a crankshaft to which crankshaft at least one of said extremities is linked.

67. *(Amended)* The device of claim 61, including a device known as a scotch yoke to which an end of at least one of said extremities is linked.

75. *(Amended)* The device of claim 61, including means defining a volume for passage of fluids to or from said working chambers, said means substantially surrounding said cylinder assembly.

106. *(Twice Amended)* A device for the working of fluids comprising a structure, at least one cylinder assembly having a circumferential depression and directly mounted in said structure and a component reciprocable in said

assembly, said component having two open cylindrical ends and at least one circumferential projection reciprocable in said circumferential depression in said assembly to form at least one pair of torroidal fluid working chambers of cyclically variable capacity, said component having at least one internal volume for passage of fluids to said working chambers, said structure including insulating material to restrict heat transfer from said assembly.

118. *(Amended)* A device for the working of fluids comprising a structure, a cylinder assembly mounted in said structure, a component reciprocable within said assembly, filamentary material, said component having at least one longitudinal extremity and at least one circumferential projection, said cylinder assembly having at least one circumferential depression in which said projection is positioned to reciprocate, said projection and depression defining a pair of torroidal fluid working chambers of cyclically variable capacity and means defining a volume for passage of fluids to or from said working chambers, said means being substantially located within said structure, said volume containing said filamentary material.

121. *(Amended)* The device of claim 118, wherein said structure at least partly comprises insulating material.

184. *(Amended)* A device for the working of fluids comprising a device known as a scotch yoke having at least one elongate slot, at least two crank and crank-pin assemblies, a cylinder assembly and a component reciprocable within said assembly, said component having at least one longitudinal extremity and at

least one circumferential projection, said cylinder assembly having at least one circumferential depression in which said projection is positioned to reciprocate, said projection and depression forming a pair of torroidal fluid working chambers of cyclically variable capacity, said component having at least one internal passage for movement of fluids to and from said working chambers and being linked mechanically to said scotch yoke, said crank assemblies being linked to at least one of said slots and are coaxial and contra rotatable.

Please add new claims 195, 196 and 197 as follows:

--195. *(New)* The device of claim 184, wherein said component is composed of elements of ceramic material held in assembled condition by at least one fastener loaded in tension. --

--196. *(New)* The device of claim 195, including means for conducting electricity in a designed circuit, said means being embedded within at least one of said elements. --

-- 197. *(New)* The device of claim 143, including means for conducting electricity in a designed circuit, said means being embedded in said ceramic material. --

REMARKS

Reexamination of this application and reconsideration of the rejection of the claims thereof are respectfully requested under the provisions of Rule 116 for the reasons set forth below.

Claims 81 and 102 have been called for filamentary material to be contained in said internal passage. Accompanying this amendment is a drawing marked in red to show filamentary material in the internal passage as well as a Letter to the Draftsman. Support for this correction to the drawings may be found on page 104, lines 1 to 3 and page 208, line 1.

Before discussion of the rejection of the claims is undertaken, the Examiner's attention is directed to certain claims under rejection which are also dependent directly or indirectly on allowed independent claims. Reference is made to claims 170, 171, 173, 174, 176 and 177 based directly or indirectly on one of claims 54, 55 and 107. It is submitted that the above indicated claims also should be considered as allowable.

Claims 61, 66-70, 75, 76, 78, 80, 83, 86, 84-92, 98, 99, 108 and 112-115 stand rejected under 35 USC 103(a) on Brown in view of Goldsborough because

"Brown shows the toroidal working spaces defined by a piston and cylinder. However, the cylinder is made of metal. Goldsborough is merely cited as an example of the well known use of ceramic materials in engines so as to improve efficiency. The working element is coated with ceramic material and a fasteners 16 under tension are provided. Likewise, the cylinder has ceramic liners 20 assembled by fasteners (see 4 bolts mounted in a mirror image) under tension. To modify the piston and cylinder of Brown to be assembled with ceramic liners and consequently the necessary fasteners would have been obvious to one of ordinary skill in the art in view of Goldsborough so as to improve engine efficiency. In regard to claims 89-92, to use a piston/cylinder assembly in any of the recited power systems would have been obvious. In regard to claims 98 and 99, the depressions read on common manufacturing intolerances. A common spark plug reads on the electric circuit in the ceramic."

This rejection is respectfully traversed in view of the amendment. Brown makes no reference to the use of ceramic material as acknowledged by the Examiner. Goldsborough refers to an engine in which the piston extensions are provided with a lining of refractory material and the cylinder extensions are inherently of refractory material.

Goldsborough does not disclose or suggest a multiplicity of elements of ceramic material being held abutted with one another by a fastener loaded in tension. Goldsborough is dealing with modifying a conventional metal engine. Applicant, on the other hand, is claiming an uncooled ceramic engine. The concepts are entirely different and the teaching of one is not inherently the teaching of the other.

The present invention arose out of the idea to build an engine out of solid ceramic components. It was realized that for such to be commercially viable, the engine would have to have an entirely different configuration.

Present engines have evolved under three constraints: the materials characteristics of metals; the need for cooling (the water jacket, present block design); the most viable ways of manufacturing and assembling metal components. With uncooled ceramic engines all of these restraints become irrelevant and a new series of restraints would have to be imposed.

After consideration of the new parameters, the configurations of the disclosure were invented. These configurations are very different from those

present in commercial engines and pumps (see Figures 236, 237, 254, 255, 354 through 359, 408 through 411, 415 through 420, etc.)

It has not been possible to build engines of conventional design of integral ceramics as demonstrated by the failed efforts of the auto industry in the 1980's. Two small examples: the shape of the conventional poppet valve is appropriate for its metal construction. If built in ceramic, the sharp loads caused by the valve returning to its seat tend to cause the head to fracture and the bottom of the stem to separate from the head (due to tensile stresses caused by deceleration of the stem mass), since ceramics generally are less ductile and much weaker in tension relative to strength in compression. Today's engine blocks all have tapped screw threads, holding spark plugs, injectors, attachments, etc. It is not really practical to tap and screw into ceramics.

These constraints were part of the reasons why the present invention mostly eliminates poppet valves and shows new arrangements for assembling components. In fact, it seems that the only way to build uncooled ceramic engines is to press components against each by fasteners loaded in tension.

Claims 62, 63, 106, 126, 131, 141, 146, 151, 156 and 161 stand rejected under 35 USC 103(a) on Brown in view of Goldsborough as applied to claim 61 and further in view of U.S. Patent No. 3,112,810 to Nallinger because

"It would have been obvious to located [sic] the engine of Brown in the noise deadening housing of Nallinger so as to reduce objectional noise levels. The foam material is deemed inherently thermally insulative."

This rejection is respectfully traversed in view of the amendment.

Nallinger shows a housing around a conventional engine separated by an air space between. (A fan is shown dotted, implying a radiator and water cooling system.)

For a conventional engine to function properly, at its designed temperature equilibria, a given amount of engine heat energy must be transferred from around the cylinder to the ambient air. In present engines this is achieved both by the cooling system and by general radiation of the hot engine block and other components. By enclosing the engine in a housing as shown by Nallinger, the heat transfer through general radiation is inhibited. For the engine to function as designed, the capacity of the cooling system must therefore be increased.

Nallinger, by placing a housing spaced over the engine, is reducing the noise level, but at the same time lowering the capacity to remove heat from the engine in order to have the engine operate at its designed temperature equilibria. The applicant's claimed invention, on the other hand, is doing exactly the opposite, i.e. prevent the heat from escaping in order to have its engine operate at its designed temperature equilibria. Nallinger requires greater or additional cooling efforts to be made to maintain equilibria while putting a housing on his engine while applicant, by adding an insulated structure, eliminates or reduces the need for further heat to maintain equilibria since the engines of the present invention are designed to run uncooled.

An insulated structure as part of the engine only makes long-term commercial sense if the engine is designed from the outset to be an uncooled engine, as is the case in the present invention.

The air jacket shown in Nallinger is a relatively impractical insulation, since the single volume easily permits heat transfer by convection and adds much bulk to the engine assembly. In contrast, in the present invention, the structure is attached directly to the cylinder assembly.

Claims 82, 103, 118, 128, 133, 136, 138, 143, 148, 153, 158, 163, 166 and 168 stand rejected under 35 USC 103(a) on Brown in view of Goldsborough as applied to claims 75 and 106 above and further in view of U.S. Patent No. 3,503,716 to Burger because

“Berger disclose the use of catalytic filamentary materials 23 for treating the exhaust of an engine and to apply its use toward the engine of Brown would have been obvious to one of ordinary skill in the art. The phrase ‘at least partially surround’ is broad enough to read on the catalyst being located anywhere.”

In view of the amendment to claim 118, the rejection is respectfully traversed.

Berger does not show or teach a volume substantially within an engine or device which contains filamentary material.

It is not obvious to place filamentary material in exhaust processing volume within engine.

As the present and previous citations, all present exhaust treatments occur in a volume outside of and remote from the engine. Effective treatment depends

on the time the gases spend in the volume, which therefore needs to be as large as practical. Conventional engines have a short small exhaust port, typically of diameter equal to or less than valve head, beyond which the gases leave the engine and are conducted in pipes to a remote treatment volume. The volume of the exhaust port is too small to contain cost-effective treatment devices.

In the present invention, the engine components have been radically rearranged (in some sense they may be described as being turned “inside out”) to enable a designer to create large fluid treatment volumes within the engine. Only if those large volumes are present is it commercially practical to introduce treatment methods including filamentary material within the engine.

In very general terms, the speed of chemical reactions increases roughly four times with a doubling of temperature. Because the disclosure relates to uncooled engines and other devices, an exhaust processing volume within the present engines could be at a temperature two to three times greater than that in the reactor of the citation, making such a volume potentially four to nine times more effective in the general treatment of exhaust-borne pollutants. The opportunity to locate relatively large exhaust treatment volumes within an engine is a significant advancement in the art of exhaust treatment. Again, we are dealing with a liquid cooled engine as versus an uncooled engine.

Claim 121 stands rejected under 35 USC 103(a) on Brown in view of Goldsborough and Berger as applied to claim 118 and further in view of Nallinger as applied above.

In view of the amendment to claim 118, the patent to Nallinger does not supply the lack of teaching of the three references applied.

Claim 123 stands rejected under 35 USC 103(a) on Brown in view of Goldsborough and Berger as applied to claim 118 and further in view of U.S. Patent No. 1,205,895 to Hoyt because Hoyt “shows the use of a scotch yoke and two oppositely rotating crankshafts to minimize vibration and to do likewise in Brown would have been obvious to one of ordinary skill in the art.”

For reasons as stated above with respect to the rejection of claim 118, this rejection is respectfully traversed as Hoyt does not supply the lack of teaching of the three applied references.

Claims 184, 185, 192 and 193 stand rejected under 35 USC 103(a) on Brown in view of Hoyt as applied above.

This rejection is respectfully traversed inasmuch as Hoyt does not suggest or teach coaxial assemblies.

Claim 186 is rejected under 35 USC 103(a) on Brown in view of Hoyt as applied to claim 184 above and further in view of Nallinger as applied above.

This rejection is respectfully traversed for reasons as stated above with respect to the rejection of claim 184 and because Nallinger does not supply the lack of teaching of the other two references.

Claims 187-191 stand rejected under 35 USC 103(a) on Brown in view of Hoyt as applied to claim 184 above and further in view of Goldsborough as applied above.